

Remarks

Applicant has cancelled claims 44-45 and amended claims 41 and 53. Entry of the amendment and favorable consideration thereof is earnestly requested.

Claim 41 requires among other elements a “camera including . . . camera information relating to said camera; and a multiplexer” and “a camera control unit generating a command signal for operating said camera based on received camera information” where the “image data, the command signal and camera information multiplexed on said pair of wires.” Claim 53 requires among other elements “transmitting camera information from the camera to the camera control unit; generating a command signal based on the received camera information . . . generating image data . . . multiplexing the image data, the command signal and camera information to form a multiplexed signal” and “transmitting the multiplexed signal via the pair of wires to the camera control unit.” Applicant respectfully submits that these elements is not disclosed or taught in any of the cited prior art.

The Examiner has submitted that U.S. Patent No. 5,896,166 (“D’Alfonso et al.”) “fails to disclose a multiplexer for multiplexing signal from the camera head to the camera control unit and vice versa” but that “[m]ultiplexing of signals is a well know concept in the electrical arts” and that McKenna et al. teaches “that multiplexing signals between the camera head to the processing means reduces the number of wires and thus reduces the diameter necessary to accommodate such.” (Official Action 12/28/06, p. 4)

First, Applicant would like to highlight the fact that D’Alfonso et al. teaches that an “[i]mager 32 generates an image, or pre-video signal, which passes through amplifier 36 and returns to the camera control unit 1 through the pre-video line 48.” (Col. 3, Ins. 27-29 & 61-63.) The image signal is generated by either a CCD, a CID or a CMOS device and comprises an analog video signal as no digital conversion is described prior to transmission to the camera control. (Col. 1, Ins. 15-18; See, FIGS. 2-3.) D’Alfonso et al.

further describes that command signals are transmitted on separate lines from the image signal and are transmitted on a time-division basis. (Col. 4, Ins. 1-11.) Nowhere does D'Alfonso et al. disclose or teach that the analog image signal may be transmitted on the same line or at the same time as the digital command signals.

U.S. Patent No. 6,261,226 ("McKenna et al.") teaches that "where it is desired to utilize a large number of CCD elements and/or non-visual sensor means on the endoscope, the number of separate connecting means extending between these elements and their associated processing means may become too large to fit conveniently through the shaft of the endoscope. In this case, the various outputs . . . may be multiplexed" and that the "outputs from these CCD elements 70 are multiplexed through a multiplexer 350 so that their output signals can be transmitted through the endoscope's shaft by a reduced number of wires 352." (Col. 21, Ins. 38-50.) Therefore, while McKenna et al. may teach that a group of analog image signals may be multiplexed onto a signal line, nowhere does McKenna et al. disclose or teach that an (analog) image signal may be multiplexed with a (digital) command signal. U.S. Patent No. 5,311,859 ("Monroe et al.") also fails to disclose or teach this limitation.

Accordingly, while the Examiner has submitted that it would be obvious to modify D'Alfonso et al. to multiplex the image signal with another signal, Applicant respectfully submits that such a modification would not result in a functioning device and therefore can not be obvious. McKenna et al. also fails to disclose or suggest such a combination of signals. To make such a combination function, one would have to either convert the image signal to a digital signal or convert the command signal(s) to analog format. Converting the command signal(s) to analog format, however, would require a major redesign of the camera control and would result in a less flexible or controllable system. To convert the image signal to a digital signal for transmission to the camera control would require that additional processing circuitry be provided in the camera head. However, Applicant notes that D'Alfonso et al. specifically states it is important that the "camera head/endoscope combination, or video-endoscope, is lightweight and easily

manipulable by the surgeon.” (Col. 1, Ins. 23-25; See, Col. 2, Ins. 25-27.) To accomplish this, D’Alfonso et al. rejects the idea of placing image processing circuitry in the camera head. (Col. 8, Ins. 12-21, “Locating a . . . processing means in the camera head 3 . . . would result in the camera head 3 being too large for endoscopic or other applications operating under tight space constraints.”) Accordingly, D’Alfonso et al. teaches away from placing additional circuitry in the camera head. However, based on the Examiner’s suggested combination, one would have to add at least both conversion circuitry and multiplexing circuitry to the camera head of D’Alfonso et al. to make the combination suggested by the Examiner actually function. Such a combination and modification, however, works contrary to the teachings of D’Alfonso et al. and therefore can not be obvious.

It is respectfully submitted that claims 41-43, 46-51 and 53-58, all of the claims remaining in the application, are in order for allowance and early notice to that effect is respectfully requested.

Respectfully submitted,

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